UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/181,021	10/27/1998	YASUO YOSHIOKA	51270-245583	9412

7590 01/16/2003

ROGER R WISE
PILLSBURY MADISON & SUTRO
725 SOUTH FIGUEROA STREET
SUITE 1200
LOS ANGELES, CA 900175443

EXAMINER
ARMSTRONG, ANGELA A

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 01/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/181,021	YOSHIOKA ET AL.	
	Examiner	Art Unit	
	Angela A. Armstrong	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-12,14-18 and 20-46* is/are rejected.

7)☒ Claim(s) *3,13 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 15, 2002 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 5-12, 15-18, 20-21, and 23-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sethares (US Patent No. 5,504,270) in view of Serra (US Patent No. 5,536,902).

Sethares discloses a method and apparatus for dissonance modification to audio signals.

Regarding claims 1, 25, 37 and 43, at Figure 4A and 4B and col. 4, lines 49-52; col. 5, lines 24-29 and col. 9, line 35 to col. 10, line 57, Sethares discloses vocal input is passed to an analyzer to produce a spectrum of input partials in the form of frequency and amplitude domain,

which reads on "extracting deterministic components from the input voice signal, the deterministic components including a plurality of sinusoidal wave components", since frequency and amplitude are forms of sinusoidal wave components.

Sethares does not teach extracting only the deterministic components. However, implementation of extracting only deterministic components in a synthesizing system was well known.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements extraction of only deterministic components (col. 10, lines 3-29), for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the embodiment of Sethares to specifically allow extracting only deterministic components from the input signal, as taught by Serra, for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra, because such a modification would account for more of the residual variations in the data.

Additionally, at col. 10, lines 16-17, Sethares teaches the system allows a user to provide input timbre information by accessing information stored in the computer database, which reads on "memory means for memorizing reference pitch information."

Additionally, at col. 9, line 35 continuing to col. 10, line 57, Sethares teaches the modification of the frequencies of the partials based on a desired pitch or timbre, which reads on

"modulating means for modulating the frequency value coordinates of the sinusoidal wave components."

Additionally, at col. 10, lines 35-43, Figure 4A, element 16, Figure 4B, and Figure 5, Sethares teaches implementation of a synthesizer for mixing the modulated sinusoidal components.

Regarding claim 2, Sethares and Serra teach everything as claimed in claim 1. Additionally, at col. 10, lines 6-51, Sethares teaches implementation of an MIDI controller which allows the user to provide input timbre information.

Regarding claims 5 and 7, Sethares and Serra teach everything as claimed in claim 1. Additionally, at col. 10, lines 13-27, Sethares teaches the implementation of the MIDI controller which allows user access to timbre profiles stored in a database, and teaches the system allows access to the input and reference partials to modify dissonance, which reads on "memorizing means."

Sethares does not specifically teach modulating amplitude of the sinusoidal wave components. However, modifying the amplitude of sinusoidal wave components in a synthesizing system was well known in the art.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements modifying the obtained frequency and amplitude parameters to generate a desired synthesized output (Abstract, col. 11, lines 10-67), for the purpose of improving the musical synthesizer.

It would have been obvious to one of ordinary skill at the time of the invention, to modify the system of Sethares to implement amplitude modification, as taught by Serra, for the purpose of expanding the capabilities of the audio modification system.

At col. 10, lines 35-43, Figure 4A, element 16, Figure 4B, and Figure 5, Sethares teaches implementation of a synthesizer for mixing the modulated sinusoidal components.

Regarding claim 6, Sethares does not specifically teach a control parameter to control the degree of modulation of the amplitude. However, implementation of control parameters for various amplitude parameters was well known.

Serra teaches implementation of user controlled amplitude parameters, such as tilt, for the purpose of allowing the user to freely control the parameter to accurately reflect the user's intentions (col. 11, lines 11-29).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Sethares to implement parameter control of amplitude data, for the purpose of allowing the user to freely control the parameter to accurately reflect the user's intention.

Regarding claim 8, Sethares does not specifically teach separating the residual component after the sinusoidal components have been extracted.

Serra teaches (col. 10, lines 3-29) extraction of the frequency and amplitude components as the deterministic component and after the components are extracted, the residual or stochastic component is obtained.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Sethares to obtain the residual components after the sinusoidal

components are obtained, to ensure the residual components are determined from a current frame to accurately reflect the variation of the input signal.

Regarding claims 30, 33, 36, and 42, at col. 4, line 49, Sethares teaches implementation of Fourier analysis. Sethares does not specifically teach implementation of a peak detecting means to extract the sinusoidal components. However, implementation of peak detection algorithms in a synthesizing system was well known in the art.

Serra (col. 10, lines 3-29) teaches implementation of detecting peaks in the magnitude spectra and is extracted and is used to obtain the time-series frequency and magnitude trajectories.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system to implement detecting peaks in the magnitude spectra, as taught by Serra, for the purpose of ensuring the most accurate and essential frequency/amplitude deterministic pairs are obtained.

Regarding claims 9, 15, 26, 39, and 45, at Figure 4A and 4B and col. 4, lines 49-52; col. 5, lines 24-29 and col. 9, line 35 to col. 10, line 57, Sethares discloses vocal input is passed to an analyzer to produce a spectrum of input partials in the form of frequency and amplitude domain, which reads on "extracting deterministic components from the input voice signal, the deterministic components including a plurality of sinusoidal wave components", since frequency and amplitude are forms of sinusoidal wave components.

Sethares does not teach extracting only the deterministic components. However, implementation of extracting only deterministic components in a synthesizing system was well known.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements extraction of only deterministic components (col. 10, lines 3-29), for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the embodiment of Sethares to specifically allow extracting only deterministic components from the input signal, as taught by Serra, for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra, because such a modification would account for more of the residual variations in the data.

Additionally, at col. 10, lines 13-27, Sethares teaches the implementation of the MIDI controller which allows user access to timbre profiles stored in a database, and teaches the system allows access to the input and reference partials to modify dissonance, which reads on "memorizing means."

Sethares does not specifically teach modulating amplitude of the sinusoidal wave components. However, modifying the amplitude of sinusoidal wave components in a synthesizing system was well known in the art.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements modifying the obtained frequency and amplitude parameters to generate a desired synthesized output (Abstract, col. 11, lines 10-67), for the purpose of improving the musical synthesizer.

It would have been obvious to one of ordinary skill at the time of the invention, to modify the system of Sethares to implement amplitude modification, as taught by Serra, for the purpose of expanding the capabilities of the audio modification system.

At col. 10, lines 35-43, Figure 4A, element 16, Figure 4B, and Figure 5, Sethares teaches implementation of a synthesizer for mixing the modulated sinusoidal components.

Regarding claim 10, Sethares and Serra teach everything as claimed in claim 9. Sethares does not specifically teach a control parameter to control the degree of modulation of the amplitude. However, implementation of control parameters for various amplitude parameters was well known.

Serra teaches implementation of user controlled amplitude parameters, such as tilt, for the purpose of allowing the user to freely control the parameter to accurately reflect the user's intentions (col. 11, lines 11-29).

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Sethares to implement parameter control of amplitude data, for the purpose of allowing the user to freely control the parameter to accurately reflect the user's intention.

Regarding claim 11, Sethares and Serra teach everything as claimed in claim 9. Additionally, at col. 10, lines 16-17, Sethares teaches the system allows a user to provide input timbre information by accessing information stored in the computer database, which reads on "memory means for memorizing reference pitch information."

Additionally, at col. 9, line 35 continuing to col. 10, line 57, Sethares teaches the modification of the frequencies of the partials based on a desired pitch or timbre, which reads on

"modulating means for modulating the frequency value coordinates of the sinusoidal wave components."

Additionally, at col. 10, lines 35-43, Figure 4A, element 16, Figure 4B, and Figure 5, Sethares teaches implementation of a synthesizer for mixing the modulated sinusoidal components

Regarding claim 12, Sethares and Serra teach everything as claimed in claim 11. Additionally, at col. 10, lines 6-51, Sethares teaches implementation of an MIDI controller which allows the user to provide input timbre information.

Regarding claim 16, Sethares does not specifically teach separating the residual component after the sinusoidal components have been extracted.

Serra teaches (col. 10, lines 3-29) extraction of the frequency and amplitude components as the deterministic component and after the components are extracted, the residual or stochastic component is obtained.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Sethares to obtain the residual components after the sinusoidal components are obtained, to ensure the residual components are determined from a current frame to accurately reflect the variation of the input signal.

Regarding claims 31, 34, 38 and 44, at col. 4, line 49, Sethares teaches implementation of Fourier analysis. Sethares does not specifically teach implementation of a peak detecting means to extract the sinusoidal components. However, implementation of peak detection algorithms in a synthesizing system was well known in the art.

Serra (col. 10, lines 3-29) teaches implementation of detecting peaks in the magnitude spectra and is extracted and is used to obtain the time-series frequency and magnitude trajectories.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system to implement detecting peaks in the magnitude spectra, as taught by Serra, for the purpose of ensuring the most accurate and essential frequency/amplitude deterministic pairs are obtained.

Regarding claims 17, 23, 27, 28, 29, and 41 at Figure 4A and 4B and col. 4, lines 49-52; col. 5, lines 24-29 and col. 9, line 35 to col. 10, line 57, Sethares discloses vocal input is passed to an analyzer to produce a spectrum of input partials in the form of frequency and amplitude domain, which reads on "extracting deterministic components from the input voice signal, the deterministic components including a plurality of sinusoidal wave components", since frequency and amplitude are forms of sinusoidal wave components.

Sethares does not teach extracting only the deterministic components. However, implementation of extracting only deterministic components in a synthesizing system was well known.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements extraction of only deterministic components (col. 10, lines 3-29), for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the embodiment of Sethares to specifically allow extracting only deterministic components from the input signal, as taught by Serra, for the purpose of generating a synthetic waveform of the deterministic component and then reanalyze and reextract the deterministic component, which is then subtracted from the magnitude spectra, because such a modification would account for more of the residual variations in the data.

Additionally, at col. 10, lines 13-27, Sethares teaches the implementation of the MIDI controller which allows user access to timbre profiles stored in a database, and teaches the system allows access to the input and reference partials to modify dissonance, which reads on "memorizing means."

Sethares does not specifically teach modulating amplitude of the sinusoidal wave components. However, modifying the amplitude of sinusoidal wave components in a synthesizing system was well known in the art.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements modifying the obtained frequency and amplitude parameters to generate a desired synthesized output (Abstract, col. 11, lines 10-67), for the purpose of improving the musical synthesizer.

It would have been obvious to one of ordinary skill at the time of the invention, to modify the system of Sethares to implement amplitude modification, as taught by Serra, for the purpose of expanding the capabilities of the audio modification system.

Additionally, at col. 10, lines 16-17, Sethares teaches the system allows a user to provide input timbre information by accessing information stored in the computer database, which reads on "memory means for memorizing reference pitch information."

Additionally, at col. 9, line 35 continuing to col. 10, line 57, Sethares teaches the modification of the frequencies of the partials based on a desired pitch or timbre, which reads on "modulating means for modulating the frequency value coordinates of the sinusoidal wave components."

At col. 10, lines 35-43, Figure 4A, element 16, Figure 4B, and Figure 5, Sethares teaches implementation of a synthesizer for mixing the modulated sinusoidal components.

Regarding claim 18, Sethares and Serra teach everything as claimed in claim 17. Additionally, at col. 10, lines 6-51, Sethares teaches implementation of an MIDI controller which allows the user to provide input timbre information.

Additionally, at col. 9, line 35 continuing to col. 10, line 57, Sethares teaches the modification of the frequencies of the partials based on a desired pitch or timbre, which reads on "modulating means for modulating the frequency value coordinates of the sinusoidal wave components."

Regarding claim 20, Sethares and Serra teach everything as claimed in claim 17. Additionally, at col. 10, lines 6-51, Sethares teaches implementation of an MIDI controller which allows the user to provide input timbre information

Sethares does not specifically teach modulating amplitude of the sinusoidal wave components. However, modifying the amplitude of sinusoidal wave components in a synthesizing system was well known in the art.

In a similar field of endeavor, Serra teaches a method and apparatus for analyzing and synthesizing a sound by extracting and controlling a sound parameter and implements modifying the obtained frequency and amplitude parameters to generate a desired synthesized output (Abstract, col. 11, lines 10-67), for the purpose of improving the musical synthesizer.

It would have been obvious to one of ordinary skill at the time of the invention, to modify the system of Sethares to implement amplitude modification, as taught by Serra, for the purpose of expanding the capabilities of the audio modification system.

Regarding claim 21, Sethares and Serra teach everything as claimed in claim 17. Additionally, at col. 10, lines 6-51, Sethares teaches implementation of an MIDI controller which allows the user to provide input timbre information.

Regarding claim 24, Sethares does not specifically teach separating the residual component after the sinusoidal components have been extracted.

Serra teaches (col. 10, lines 3-29) extraction of the frequency and amplitude components as the deterministic component and after the components are extracted, the residual or stochastic component is obtained.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system of Sethares to obtain the residual components after the sinusoidal components are obtained, to ensure the residual components are determined from a current frame to accurately reflect the variation of the input signal.

Regarding claims 32, 35, 40, and 46, at col. 4, line 49, Sethares teaches implementation of Fourier analysis. Sethares does not specifically teach implementation of a peak detecting

means to extract the sinusoidal components. However, implementation of peak detection algorithms in a synthesizing system was well known in the art.

Serra (col. 10, lines 3-29) teaches implementation of detecting peaks in the magnitude spectra and is extracted and is used to obtain the time-series frequency and magnitude trajectories.

Therefore, it would have been obvious to one of ordinary skill at the time of the invention to modify the system to implement detecting peaks in the magnitude spectra, as taught by Serra, for the purpose of ensuring the most accurate and essential frequency/amplitude deterministic pairs are obtained.

Claims 4, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sethares (US Patent No. 5,504,270) in view of Serra (US Patent No. 5,536,902), in further view of well known prior art.

3. Regarding claims 4, 14, 22 Sethares and Serra teach everything as claimed in claims 1, 9, 17. Sethares teaches detecting a pitch of the input signal based on results of extraction at col. 9, lines 38-52.

Sethares does not specifically disclose a switch means for outputting an original of the input voice signal in situations in which a pitch is not detected from the input signal. However, implementation of a switching mechanism to output an original signal when an input signal cannot be analyzed was well known in the art.

Therefore, it would have been obvious to output an original signal in cases in which a pitch is not detected from the input signal to avoid large fluctuations in the pitch of the signal, for the purpose of providing for smooth transitions as the parameter information is synthesized and reducing the unnaturalness of the synthetic signal.

Allowable Subject Matter

4. Claims 3, 13, and 19 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or fairly disclose a voice synthesizing or converting apparatus which provides for primary pitch information representative of a discrete pitch matching a music scale, and secondary pitch information representative of a fractional pitch fluctuating relative to the discrete pitch, and thereby the output signal being synthesized according to both the discrete pitch and the fractional pitch.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Angela A. Armstrong
Examiner
Art Unit 2654

AAA
January 13, 2003

Marsha D Banks-Harold
MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600